Please amend the above-identified application as follows:

**AMENDMENTS TO THE SPECIFICATION:**

Please replace paragraph [0008] with the following amended paragraph:

**[0008]** The present invention relates to a method and apparatus for delivery of treatment chemicals to a wellbore utilizing artificial lift techniques. In the method of the present invention, one or more treatment chemicals for treating a downhole formation [[that is]] are delivered to the bottom of the wellbore in association with the placement of a plunger at the bottom of the wellbore. In one [[One]] embodiment, the invention relates to a method of applying the treatment chemical to a known plunger, such as a coiled tube plunger, or a brush plunger in the form of a gel, putty, paste or other suitable consistency such that a significant portion of the treatment chemical will be retained on the plunger as it is dropped from the well head to the bottom of the wellbore. Once at the bottom of the wellbore, the fluid in the wellbore dissolves or mixes with the treatment chemical which dissociates or diffuses into the wellbore, treating the wellbore and the near wellbore area. At predetermined times when the plunger returns to the surface additional treatment chemical can be applied to the plunger before it is again dropped to the bottom of the wellbore. Alternatively, the method can be conducted by placing the treatment chemical within a chemical dispenser attached to a standard plunger, or in a specifically designed plunger/dispenser device which is a combination of a plunger and dispensing unit.

Please replace paragraph [0012] with the following amended paragraph:

**[0012]** Also, in a preferred embodiment of the invention, the dispenser may include an extension or standoff section which allows the receptacle holding the treatment chemical to be positioned below the lower end of the tubing when the plunger assembly comes to rest at the bottom of the well. This allows the treatment chemical to be dissolved into or [[mixes]] mixed with the liquid located in the near wellbore area, thereby increasing the efficiency of the chemical delivery.

Please replace paragraph [0014] with the following amended paragraph:

**[0014]** The invention also includes a method for the recharging of chemical to the chemical delivery system. This method involves catching the chemical delivery system in a manifold[[,]] and applying chemical to the assembly without removing the assembly from the manifold.

Please replace paragraph [0016] with the following amended paragraph:

**[0016]** The chemical in the delivery system can also be recharged by removing the delivery system from the manifold and recharging the chemical. This method can be used for any form in which the chemical is used, such as, stick, time release capsules, gel, paste, putty, liquid, emulsion, etc.

Please replace paragraph [0017] with the following amended paragraph:

**[0017]** For purposes of background, an abbreviated discussion of the plunger lift technique will be presented. Those skilled in the art will recognize that there are many variations which have been used in connection with [[to]] the lift technique and system which is described. The preferred embodiment of the invention specifically described can be modified for variations of the described lift system. Further, those skilled in the art will appreciate that the present invention need not be used to the exclusion of other chemical treatment methods. Costs and other considerations can result in the use of the present invention together with other treatment methods.

Please replace paragraph [0018] with the following amended paragraph:

**[0018]** With reference to Figure 1, the [[The]] petroleum well will have a wellbore 10 which typically contains a casing 12 either throughout the entire bore or a portion of the wellbore. The wellbore 10 can also contain tubing 14 within the casing 12. In a typical arrangement, the well production will flow through the tubing 14 to the wellhead 16. For

purposes of illustrating the invention, the invention is discussed in relation to a gas well. For gas lift operations the tubing 14 can be provided with a stop 18 at the lower end of the tubing 14, and a plunger 20 which travels in the tubing 14, and to [[at]] the wellhead 16. In a typical arrangement, a manifold 22 is provided at the wellhead 16 which can have a plunger catch 30 to hold the plunger in place, a lubricator 32 to lubricate the plunger 20, and a control box (not shown) to control the flow of gas and liquid from the well by operating the valves 24, 26, and 28 and related conduits.

Please replace paragraph [0019] with the following amended paragraph:

**[0019]** The stop 18 is to prevent the plunger 20 from falling below the position of the stop 18. The stop 18 can include a spring 34 or other shock absorbing device to reduce the impact of the falling plunger 20. The plunger 20 can be of any of the numerous designs which are known in the art or another delivery system as described herein. The plunger 20 provides a mechanical interface between the gas [[38]] (not shown) and the liquid [[40]] 36 present in the well. Shutting the well off at the surface allows the plunger 20 to fall to the bottom of the well and rest on the stop 18. The pressure differential between gas trapped in the wellbore between the casing 12 and tubing 14 and in the tubing 14 above the plunger increases. The fluid will pass around the plunger 20 through a space left between the plunger 20 and the tubing 14 or through passageways in the plunger. Gas pressure builds in the well, and when the well is opened, the gas will push the plunger 20 and the liquid on top of the plunger up the tubing 14 to the surface.

Please replace paragraph [0020] with the following amended paragraph:

**[0020]** When the plunger 20 reaches the top of the well it enters or is received by the manifold 22. The manifold 22 can include a shock absorbing spring 42 or other mechanism to reduce the impact of the plunger. Appropriate sensors are provided to detect arrival of the plunger 20 at the surface and to activate plunger catch 30 which holds the plunger 20 until a signal is received to release the plunger 20. The control box (not shown) contains circuitry for opening and closing the appropriate valves 24, 26, and 28

during the different phases of the lift process, applying lubrication, if desired, to the plunger from lubricator 32 and releasing the plunger 20 to return to the bottom of the tubing 14.

Please replace paragraph [0022] with the following amended paragraph:

**[0022]** Figures 2A, 2B, 2C, and 2D illustrate several prior art plungers. These figures show several types of prior art plungers, and [[is]] are not intended to be all inclusive. Figure 2A illustrates a coiled tubing plunger 44. Each end of the coiled tubing plunger 44 is provided with a neck 46. Necks 46 are provided in most plungers to provide an area where the plunger can be caught by the plunger catcher, and also to provide an area which may be engaged by a downhole tool in the event the plunger becomes stuck in the tubing. Figure 2B illustrates a brush plunger 48. Brush plunger 48 is also provided with necks 46 at each end. The brush 50 may be a flexible nylon brush, a metal fiber brush or a brush made from any other suitable material. Figure 2C illustrates a solid bar stock plunger 52. The bar stock plunger 52 has necks 46 at each end, and has a plurality of ridges or a helical groove 54 along its length. Figure 2D illustrates a pad plunger 56 which has pads 58 which are made up of pad plates 60. The pad plates 60 can be spring loaded so that they expand or contract to maintain contact with the inside of the tubing. The illustrated pad plunger 56 is a two-pad plunger but pad plungers can have one or more pads. The illustrated pad plunger 56 has a neck 46 at the top. However, a neck can also be provided at the opposite end. Each plunger has one or more interface sections 62 which are the portions of the plunger designed to interface with the inside of the tubing.

Please replace paragraph [0024] with the following amended paragraph:

**[0024]** Referring now to Figure 3, there is shown a delivery system 64 for chemicals. Only a portion of the plunger 20 is shown. The system 64 is a plunger 20 with an attached chemical dispenser 65. The plunger 20 can be of any known design which has a neck 46 on the lower end. In this embodiment, chemical dispenser 65 has a head portion 66 and a member 68 which defines a receptacle 70 for receiving treatment chemical 72. Head 66

defines an opening 95 to receive the lower portion of plunger 20 and the plunger neck 46. Head 66 includes attachment mechanism for attaching the dispenser 65 to the plunger. One attachment mechanism can be a set screw 76 in threaded passageway 78 in head 66. Another attachment mechanism can be a spring loaded bolt 80 in passageway 82. A spring 84 biases the bolt 80 against the neck 46 of the plunger 20. A ridge 86 can be provided in the passageway 82 against which the spring 84 rests. To remove the head 66 the bolt 80 and screw 76 are retracted. For purposes of illustration two different attachment mechanisms are shown in Figure 3. Typically one or more of the same attachment mechanisms will be utilized, for example, one or more set screws 76, or one or more bolts 80, rather than having a mixture of different types of attachment mechanisms.

Please replace paragraph [0029] with the following amended paragraph:

**[0029]** Figure 6 is a partial view of a chemical dispenser 116. In this embodiment, a cap 126 having a threaded surface 128 for engaging threaded surface 130 of the wall 135 defining the receptacle 70 is provided. As shown in Figure 3, the [[The]] cap 126 contains lower ports 96, while the [[. The]] wall defining the receptacle defines upper ports 94. In this embodiment, between head 118 and chemical dispenser 116 is standoff section 120. Standoff section 120 has the length $L_1$ and receptacle section 70 has a length $L_2$. For purposes of illustration, only one side of tubing 14 is shown together with stop 18. In this illustration stop 18 includes a shock absorbing spring 122 which absorbs the impact of the delivery system. Head 118 is provided with a surface 124 which contacts the spring of the stop 18. Standoff section 120 has a sufficient length to allow the receptacle 70 to be positioned below the lower end of tubing 14. This is advantageous because it allows the chemicals in the receptacle to diffuse in the wellbore below the tubing, rather than diffusing inside the tubing. Generally, the treatment of the formation will be more effective when the chemical diffuses directly into the space below the tubing. Preferably, the chemical dispenser 116 is dimension such that at least a portion of it will pass through the stop. An advantage of the present invention is that the assembly can be constructed to place the dispenser at a predetermined location in relation to the stop. Pressure drop occurs

across the stop during operation, and this pressure drop can produce temperature and pressure changes which cause scale deposits to form in the stop. If scale deposits are allowed to buildup on the stop, the deposits can become great enough to cause the plunger to become stuck in the stop. If this occurs, it may be necessary to use wireline removal techniques, or a rig to pull the tubing. With the present invention, treatment chemicals are delivered and concentrated in the vicinity of the stop, and thus scale formation can be very effectively treated. Indeed, the dispenser can be configured to come to rest within the stop for treatment of scale, and later reconfigured to add in the [[stand off]] standoff section to provide treatment below the stop.

Please replace paragraph [0034] with the following amended paragraph:

**[0034]** Figure 12 illustrates plunger/dispenser 190. Previous embodiments discussed related to a chemical dispenser to be attached to a known plunger and a modification of the known plunger by the application of treatment chemicals known to be useful in the present invention. Figure 12 relates to an embodiment of the present invention in which the device is specifically configured to be both a plunger and a chemical delivery system. The assembly has an upper portion 192 which includes an interface section 194. The interface section [[Interface portion]] is that portion which is adjacent to the inside wall of the tubing. The interface section may be coiled tubing, a brush, pads, wobble rings or other known interface sections. The interface section fits inside the tubing snugly. When the pressure is released from the well and the plunger travels to the surface, the interface section serves to retain much of the fluid above the top of the plunger above the plunger so that it may be pushed out at the well head. Below the interface section is the lower section 196. The lower section 196 can include any type of receptacle to receive chemicals, such as an absorbent pad or matrix, or other suitable structure as described above. In the illustrated embodiment, the receptacle is a stiff wire mesh 198, and chemical has been deposited in the interstices between the mesh. A lower port [[195]] not shown can be provided at the bottom, and a series of ports [[197]] not shown can be provided along the length of lower section 196. Thus lower section 196 defines a receptacle having one or

more upper ports and one or more lower ports. This embodiment also has a standoff section 200 for elongating the system such that all or a portion of the receptacle will be below the end of the stop on the tubing. The lower end of the upper section 192 is of reduced diameter to provide surface 202 for contacting the stops. A neck 204 is provided on the top. Figure 13 is a cross section of Figure 12 along line 13-13. The cross section is of a multipoint star design. This design increases the surface area of the dispenser exposed to the well liquid and provides flow paths for the liquid. In the preferred embodiment the chemical receptacle portion 198 of the apparatus 190 is of small enough dimensions to pass through the stop at the bottom of the tubing.

Please replace paragraph [0036] with the following amended paragraph:

**[0036]** Referring to Figure 1 the present invention also includes a chemical application assembly 240. A section of conduit 242 of the manifold 22 below the lubricator [[30]] 32 receives the plunger which is caught by plunger catcher [[28]] 30. Plunger catcher [[28]] 30 has a movable pin 244 which can engage a neck on the plunger or the delivery system. When it is desired to release the plunger the pin 244 is retracted to allow the plunger to fall. Designs and construction of plunger catchers are well known in the art.

Please replace paragraph [0037] with the following amended paragraph:

**[0037]** [[Designs and construction of plunger catchers are well known in the art.]] Chemical application assembly 240 includes a chemical storage reservoir 246 which is connected by conduit 248 to a valve 250 which is connected to applicator 252. Applicator 252 can be a nozzle, an open end of conduit, or other device. The selection of the specific applicator will be made taking into account the physical characteristics of the form of the treatment chemical. In a preferred embodiment, the treatment chemical for use with the chemical application assembly will be a viscous liquid or gel. Once the receptacle section of dispenser is aligned with the applicator, the valve 252 can be opened and chemical forced onto the plunger or into the chemical dispenser to recharge the treatment chemical. Any suitable mode of force can be utilized to force the chemical from storage container

246 including pressurizing the storage container 246 or by pumping. The use of the chemical application apparatus 240 is not required. Alternatively, the plunger and/or the plunger and chemical carrier can be removed from manifold 16, inspected and the chemical agent recharged if needed.

Please replace paragraph [0038] with the following amended paragraph:

**[0038]** The chemical carrier can be made out of any material which is suitable for use in the construction of plungers. While necks have been illustrated, any other design known in the art which allows engagement with a recovery tool or with the plunger catcher is acceptable.